

ART. X.—*Additions to the Lichen Flora of Queensland.*

BY JAMES STIRTON, M.D., F.L.S., &c.

[Contributed by the REV. J. E. TENISON-WOODS, F.G.S., Sept. 9th, 1880.]

I AM mainly indebted to Mr. F. M. Bailey, of the Queensland Museum, Brisbane, for the materials of this paper. A small proportion has been contributed by Mr. Hugh Paton, of Glasgow, while on a tour through Southern Australia. Mr. Bailey's collections are chiefly from the neighbourhood of Brisbane, although on several occasions he extended his excursions many miles into the interior and along the coast. Considerable difficulty has been experienced in the discrimination of species, and this has arisen, for the most part, from two causes—first, from the close affinities of the species to those of different and distant localities, whose extremes may be stated to be South Africa on the one side, and the Eastern Archipelago on the other. In several instances, indeed, I have been obliged to leave the determination in abeyance until a more extended series of specimens shall have enabled me to settle the question of specific distinction, or to merge them into others known and determined; second, from defect or excess (so to speak) of development. While this difficulty has to be encountered more or less in all tropical and sub-tropical lichens, it is enhanced in a much greater degree than usual in those from Queensland. The causes at work likely to produce this condition of things have strongly excited my curiosity. In the absence, however, of the knowledge of well-ascertained atmospheric conditions I have endeavoured, by a sort of reflex process, to construct atmospheric peculiarities likely to give rise to the curious interruptions to the vegetative processes of lichens from Brisbane.

The first and main presumption is, that the rainy season (if there is such properly so called) is frequently interrupted by clear, bright, dry days. Now such interruptions, however favourable to plants rooting in the soil, are adverse to a continuous development of lichens whose growth is nearly entirely dependent on atmospheric moisture and heat.

Again, the few specimens found growing on earth rarely show fructification, or, if so, the spores are seldom fully developed; and the inference from this is, that the soil is porous or sandy, and has a very meagre, or, it may be, discontinuous substratum of clay.

3rd. The dry season or seasons are very dry, and with few or short interruptions of rain, such, indeed, as can scarcely perceptibly advance the development of lichens, whose growth at the quickest is much slower than that of any other section of botany.

4th. A considerable portion of the lichens show, at first sight, fully developed conditions; but a microscopic examination reveals the fact that, in many, the vegetative processes are all past, and the spores gone, although the apothecia look fresh and plump. This phenomenon also goes towards confirming my previous assertions of the atmospheric conditions, inasmuch as the exceptional dryness is favourable to the preservation of old lichens; while in moister, colder countries, maceration and consequent disintegration of dead vegetable tissues soon serve to dissipate the whole.

There are other minor considerations that tend to the same conclusions. On the whole, then, it cannot be said that the atmospheric conditions of the neighbourhood of Brisbane are favourable to the growth and development, as well as spread, of lichens.

*SIROSIPHON PULVINATUS, sp. nov.*

Thallus niger vel fusco-niger, effusus, minute coralloideo-compactus, pulvinulos plus minus confertos (latit. usque ad 3 mm.) formans, et filamenta, irregularia, ramosula (latit. .02—.03 mm.), tomentoso-intricata sistens, filamentis extus omnino hyalinis (non cellulosis) et gonimia majuscula sordide violacea vel etiam sordida, 1—4 transverse sita continentibus.

Supra thallum et apothecia *Lecideæ foliatæ* parasiticus.

The violaceous colour of the gonimia is changed by K to a greenish-yellow.

This plant, which has close affinities to *Sirosiphon*, has puzzled me much, and, in the absence of fructification, has been placed here only provisionally.

*OBRYZUM SCABROSUM, sp. nov.*

Parasiticum supra thallum cujusdam collematis apothecia minuta immersa extus prominula rugosula, perithecio dimidiatim nigro; sporæ 8 næ incolores, obtuse fusiformes,

(1—3)—nucleatæ, rarius simplices,  $\cdot 012$ — $\cdot 018 \times \cdot 0055$  mm.; paraphyses irregulares. Iodo gel. hym. non colorata nisi flavescens thecæ pallide fulvescentes.

Ipswich (No. 99, coll. Bailey).

*USNEA ELEGANS*, *sp. nov.*

Thallus (K—C—) pallide flavescens, teres firmus, erectus (altit. 1—2—pollicaris), parcissime divisus, interdum simplex et tunc rigidus, undique densissime fibrillosus; axis medullaris tenellus fere filiformis (K—C—); apothecia concoloria vel pallidiora, terminalia, plana (latit. 6—13 mm.), receptaculo fibrilloso præsertim margine; sporæ 8 næ incolores, ellipsoideæ vel late ellipsoideæ, simplices,  $\cdot 0085$ — $\cdot 011 \times \cdot 006$ — $\cdot 008$  mm. Iodo gel. hym. intense cærulescens dein obscurata.

Corticola in Gowrie Mountain, Darling Downs (coll. Bailey, No. 13).

*RAMALINA PERPUSILLA*, *sp. nov.*

Thallus pallescens vel pallide cervinus rigescens furcatim divisus parvus (altit.  $\cdot 5$ —1—pollicaris), compressus, sæpe lacunose impressus et hinc inde (præsertim infra) foraminibus oblongis terebratus, subfastigiatus; apothecia concoloria vel pallidiora mediocria (latit.  $\cdot 8$ — $1\cdot 5$  mm.), marginalia receptaculo demum subpedicellato; sporæ 8 næ incolores oblongæ, rectæ vel leviter curvulæ, 1—septatæ,  $\cdot 012$ — $\cdot 015 \times \cdot 004$ — $\cdot 005$  mm.

Corticola prope Brisbane River (coll. Bailey, 113).

*RAMALINA EXIGUELLA*, *sp. nov.*

Thallus pallidus vel pallide stramineus minor (altit. circ. semi-pollicaris), erectus, rigescens, fruticulosus, anguloso-compressus et longitudinaliter sulcatus (præsertim basi), supra teretiusculus, parce divisus vel ramosus ramulis pallidis setiformibus; apothecia pallida (latit.  $\cdot 5$ — $1\cdot 5$  mm.), terminalia vel subterminalia receptaculo lævigato, apice ramuli deflexi et vix unquam nigricantis appendiculato; sporæ 8 næ incolores, ellipsoideæ interdum gibbosæ, 1—septatæ,  $\cdot 01$ — $\cdot 013 \times \cdot 006$ — $\cdot 007$  mm.

Affinis *R. melanotrichi* (Laur).

Corticola prope Brisbane (coll. Bailey, 91).

*STICTINA RUTILANS*, *sp. nov.*

Thallus expansus (latit. 4—7—pollicaris), lævigatus, crassiusculus, rotundato-lobatus lobis rotundato-lobulatis, rufescens vel pallide cinnamomeo-rufescens, subtus cinnamomeus vel cupreus, nigro-tomentosus, cyphellis sat magnis (latit. usque  $1\cdot 5$  mm.), thelotremoideis cinnamomeis vel

rufescentibus; apothecia sparsa rufo-fusca (latit. 1—2 mm.), receptaculo thallino extus rugosulo præsertim juniore et pallido-ciliato et margine demum fere integro cincta; sporæ 8 næ incolores vel (vetustæ) pallide fuscæ, 1—septatæ, fusiformes,  $\cdot 027\text{—}\cdot 033 \times \cdot 007\text{—}\cdot 009$  mm. *Gonimia glomerulosa* latit. circ.  $\cdot 005$  mm.

Corticola (?) prope Brisbane.

PARMOSTICTA RUBRINA, *sp. nov.*

Thallus coriaceus, sordide luridus vel sordide rufescens, lobatus mediocris (latit. circ. 2—pollicaris), nudus, læviusculus intus citrinus, subtus flavescens-pallidus vel sordide flavescens, tomento rhizinarum pallido brevi, pseudo-cyphellis prominulis parvis planis citrinis; apothecia fusco-nigra mediocria (latit. 2—4 mm.), receptaculo thallino, rugoso aut papilloso; sporæ (6—8) næ incolores aciculares vel nonnihil bacillares, septatæ vel interdum vix septatæ (septulis 3—7),  $\cdot 06\text{—}\cdot 1 \times \cdot 003\text{—}\cdot 004$  mm.; paraphyses mediocres discretæ. Iodo gel. hym. leviter cærulescens dein fulvescens.

Corticola (?) prope Brisbane (coll. Bailey, 11).

Gonidia flavescens latit.  $\cdot 006\text{—}\cdot 011$  mm.

This may be the fully developed state of *Sticta rubella* (Hook and Tayl.), but as the apothecia in the Tasmanian specimens, from which Nylander gives his description, are without spores, there is a doubt; besides, there are other differences.

PARMELIA AMPLEXULA, *sp. nov.*

Similis *P. austro-africanæ* (Strn. Trans Glasgow Field Nat., 1877) sed minor et arcte adpressa.

Thallus flavescens, vel obscure virescenti-flavescens, laciniatulus et sæpe isidiosus (K—C erythrinus) subtus nigricans (quantum video); sporæ 8 incolores, ellipsoideæ, simplices,  $\cdot 008\text{—}\cdot 01 \times \cdot 005\text{—}\cdot 006$  mm.; paraphyses crassæ breves et quasi interruptæ.

Saxicola (coll. Bailey, 262), Fassifern.

PARMELIA BRISBANENSIS, *sp. nov.*

Thallus adpressulus pallide cinereo-glauescens laciniatus, hinc inde isidiosulus (supra K flavens), subtus niger rugosulus nudus, hinc inde parce et brevissime rhizinosus, ambitu spadiceus; medulla citrina vel virescenti-citrina (K—C—): sterilis.

Corticola prope Brisbane (coll. Bailey, 228).

Affinis *P. sulphuratæ* (Flot.).

PHYSCIA SUBLURIDA, *sp. nov.*

Thallus parvus pallidus vel virescenti-pallidus adpressus

laciniatulus (laciniis imbricatis multifidis), subtus pallidus et rhizinis pallidis munitus; medulla rufescens (præsertim supra), K—C—; apothecia parva cæsia pruinosa, margine pallido incurvo fere integro cincta; sporæ 8 næ in ascis saccatis, ellipsoideæ, fuscae 1—septatæ,  $\cdot 014$ — $\cdot 018 \times \cdot 0065$ — $\cdot 008$  mm.; hypothecium incolor.

Ad ramulos prope Brisbane (coll. Bailey, No. 241).

PYXINE OBSCURIOR, *sp. nov.*

Thallus pallidus vel glaucescenti-pallidus adpressus ambitu effiguratus vel laciniatulus; apothecia nigra sessilia plana marginata mediocria; sporæ 8 næ fuscae, distincte 1—septatæ,  $\cdot 015$ — $\cdot 02 \times \cdot 007$ — $\cdot 009$  mm.; hypothecium crassum fusco-nigrum, K rufo-ferrugineum sed epithecium eodem re-agente non mutatum. Medulla alba tenuis K flavens dein intense rubens.

Corticola prope Brisbane (coll. Bailey, No. 236).

LECANORA PULVERATA, *sp. nov.*

Thallus pallidus vel pallide glaucescens tenuis, minute rimuloso-areolatus, hinc inde minute granulosus (K—C—); apothecia sessilia (latit.  $\cdot 8$ — $1\cdot 6$  mm.), pallida vel pallide lutescentia, grosse albo-pruinosa concaviuscula dein plana, margine prominulo undulato cincta; epithecium C—; sporæ 8 næ incolores ellipsoideæ simplices,  $\cdot 009$ — $\cdot 012 \times \cdot 006$ — $\cdot 0075$  mm.; paraphyses gracilis apicibus parce citrino-inspersis; hypothecium incolor. Iodo gel. hym. cærulescens dein sordida.

Corticola, Brisbane (coll. Bailey, No. 86).

The paraphyses are rendered distinct and separate by K when they show as very fine threads. This lichen seems to play between *L. albella* and *L. galactina*.

ASCIDIUM PROFUNDUM, *sp. nov.*

Thallus albus vel albidus (K—C—), lævis rugulosus tenuis; apothecia profunde immersa in substrata (cortice), peridio nigro integro vel fere integro, ellipsoideo, collo longo angusto instructo, ostiolo supra vel extus pallido firmo rotundo aperto (diam. circ.  $\cdot 15$  mm.), columella nigra; thecæ monosporæ, sporæ incolores vel pallide lutescentes, fusiformes aut cylindraceo-fusiformes, sæpe haloniatae, muralidivisæ,  $\cdot 27$ — $\cdot 44 \times \cdot 032$ — $\cdot 045$  mm., iodo cæruleo-infuscatæ; paraphyses gracili-mæ, confertæ.

Corticola (coll. Bailey, No. 131).

The paraphyses are rendered distinct and filiform by K.

This may only be a sub-species, or even a variety of *A. depressum* (Mnt.) with larger spores, &c.

LECIDEA FOLIATA, *sp. nov.*

Thallus flavescenti-pallidus vel lurido-flavescens, microphyllinus, e squamulis convexulis crenato-incisis vel digitato-incisis, imbricatis constans, hypothallo non distincto; apothecia spadiceo-rufescentia vel testaceo-rufa, conferta, pallidius marginata, hinc inde congesta (latit.  $\cdot 6$ — $1\cdot 4$  mm.), planiuscula dein convexa et immarginata; sporæ 8 næ cylindraceæ vel fusiformi-cylindraceæ, simplicis, incolores,  $\cdot 012$ — $\cdot 016$  x  $\cdot 0025$ — $\cdot 003$  mm.), longit. interdum usque ad  $\cdot 02$  mm.; paraphyses crassiusculæ (crassit. usque ad  $\cdot 003$  mm.) non discretæ, conglutinatæ apicibus incoloribus non clavatis; hypothecium electrinum crassiusculum. Iodo gel. hym. cærulescens dein fulvescens.

Corticola prope Brisbane (coll. Bailey, 156, &c.).

Affinis *L. longiusculæ* (Nyl.) sed differt hypothecio constanter electrino, &c.

LECIDEA ABERRATA, *sp. nov.*

Thallus albus vel albidus, tenuis pulverulentus vel leproso-granulatus (*K* pallide flavescens); apothecia fusco-rufa, mediocria (latit.  $\cdot 6$ — $1\cdot 3$  mm.), sessilia, plana et tunc quasi thallino-marginata demum convexa et immarginata; sporæ 8 næ incolores simplices,  $\cdot 0085$ — $\cdot 011$  x  $\cdot 005$ — $\cdot 0065$  mm.; paraphyses graciles non bene discretæ apicibus flavescensibus inspersis (*K*—); hypothecium incolor. Iodo gel. hym. intense cærulescens dein sordida.

Ad corticem *Eucalypti crebræ* Brisbane (coll. Bailey, No. 190).

This lichen appears to be allied to *L. vernalis*.

LECIDEA SUBNUBILA, *sp. nov.*

Thallus pallidus vel (detritus) pallide cinere-virescens, lævigatus minute rimuloso-areolatus (*K* vix coloratus); medullo alba (*K* flavens, *I* cærulescens); apothecia nigra innato-sessilia, concaviuscula vel plana prominule marginata (latit. circ. 1 mm.), epithecio grosse albido-pruinoso; sporæ 8 næ incolores, simplices, ellipsoideæ vel fusiformi-ellipsoideæ,  $\cdot 014$ — $\cdot 02$  x  $\cdot 007$ — $\cdot 009$  mm.; paraphyses confertæ distinctæ filiformes apicibus fuscis conglutinatis; hypothecium fuscum vel in lamina crassa fusco-nigrum. Iodo gel. hym. intense cærulescens.

Saxicola (coll. Bailey, 261), Fassifern.

LECIDEA DEMUTANS, *sp. nov.*

Thallus (*K*fl. *C*fl.) pallidus vel pallide albidus, rugulosus vel granulatus, hinc inde diffractus, fusco-limitatus vel effusus; apothecia nigra, innata vel innato-sessilia, mediocria,

plana acute marginata; sporæ (4—8) næ olivaceæ fusiformi-oblongæ bi-loculares vel sæpe breviter polari-bi-loculares,  $\cdot 022\text{—}\cdot 03 \times \cdot 01\text{—}\cdot 013$  mm.; paraphyses distinctæ crassiusculæ, granulis et sparsius guttulis oleosis inspersæ apicibus conglutinatis clavatis; hypothecium fuscum tenue. Iodo gel. hym. cærulescens dein fulvescens vel etiam vinose rubens præsertim thecæ.

Corticola (coll. Bailey, 82).

The perithecium is entire, but thin.

LECIDEA INALBESCENS, *sp. nov.*

Thallus firmus albidus vel pallidus verrucoso-rugulosus crassiusculus, valde inæqualis (K—C—); apothecia nigra sessilia mediocria (latit. circ. 1 mm.), plana, crasse marginata, hinc inde conglomerata, epithecio sæpe virescenti-pruinoso præsertim juniore; sporæ (4—8) næ incolores fusiformes vel sæpius obtuse fusiformes, plerumque curvulæ, (6—10)—loculares (loculis parvis subquadratis),  $\cdot 03\text{—}\cdot 045 \times \cdot 0055\text{—}\cdot 007$  mm.; paraphyses distinctæ filiformes crassiusculæ apicibus rufescentibus contextis; hypothecium crassum fusco-nigrum vel nigrum. Iodo gel. hym. vinose rubescens vel etiam vinose rubens (præcedente cærulescentia nulla).

Ad lignum decorticatum prope Rosewood Scrub (coll. Bailey, 258).

Affinis *L. coniochloræ* (Mnt.).

GRAPHIS (MEDUSULA) PERTENELLA, *sp. nov.*

Thallus albus vel pallido-albidus rugulosus firmus nonnihil cerebriformis, bene evolutus (K—C—); apothecia depresso-innata flexuosa, tortuosa vel irregularia interdum ramosula, epithecio fuscescente vel pallidiore planiusculo (latit.  $\cdot 05\text{—}\cdot 1$  mm.); sporæ 8 næ incolores ellipsoideæ vel oblongo-ellipsoideæ, 4—loculares,  $\cdot 011\text{—}\cdot 016 \times \cdot 0055\text{—}\cdot 007$  mm.; paraphyses distinctæ graciles; hypothecium incolor. Iodo gel. hym. non tincta protoplasma thecarum fulvescens vel fere incolor.

Corticola, Brisbane (coll. Bailey, 79).

Allied (perhaps too nearly) to *Gr. æquabilis* (Nyl.).

GRAPHIS ELUDENS, *sp. nov.*

Thallus cinereus vel rufescenti-pallidus crassiusculus (crassit.  $\cdot 2\text{—}\cdot 3$  mm.) lævigatus, minute rimuloso-areolatus (K—C—); apothecia innata fusca, oblonga vel oblongo-lineararia vel irregularia, parce ramosula obtusa, epithecio concaviusculo vel planiusculo (latit. circiter  $\cdot 06$  mm.), interdum margine thallino discisso cincto; sporæ 8 næ fuscae 3—septatæ rarius (1—2) septatæ, oblongæ vel oblongo-ellip-

soideæ,  $\cdot 011$ — $\cdot 016 \times \cdot 004$ — $\cdot 0055$  mm.; paraphyses distinctæ crassiusculæ apicibus fuscescentibus conglutinatis; hypothecium incolor. Iodo gel. hym. non tincta nec sporæ. Gonidia majuscula flavescentia.

Saxicola (coll. Bailey, 287).

A thin lateral fuscous perithecium is seen on making a cross section.

This lichen is closely allied to *Gr. hypoglauca* (Krph.), but the spores are much smaller than those of the latter, &c.

GRAPHIS REPLETA, *sp. nov.*

Thallus pallidus fere continuus, tenuis, bene evolutus (K e flavente rubens); apothecia fusca innata, ovata vel oblonga aut nonnihil irregularia interdum aggregata, thallino-marginata vel fere nuda, epithecio concaviusculo vel planiusculo (latit.  $\cdot 2$ — $\cdot 3$  mm.); sporæ (4—8) næ incolores fusiformes, vel oblongo-fusiformes (10—17)—loculares,  $\cdot 054$ — $\cdot 075 \times \cdot 009$ — $\cdot 012$  mm.; paraphyses gracillimæ in gelatina firma involutæ, apice fuscescente granuloso inspersæ; hypothecium incolor. Iodo gel. hym. obsolete cærulescens, sporæ cæruleo-infuscatæ.

Corticola, Brisbane (coll. Bailey, 226 ex parte).

The paraphyses appear as very fine threads imbedded in a stiff jelly such as are seen in one or two of the *Glyphides* when treated with K.

GRAPHIS CIRCUMFUSA, *sp. nov.*

Thallus pallide vel sordide cervinus sæpe ad rufuscentem mergens, minute areolatus vel continuus, hinc inde nonnihil farinaceus (K flavens dein intense rubens); apothecia oblonga vel irregularia interdum ramulosa, innata, pallida vel albida, margine thallino prominulo irregulari cincta, intus tota incoloria, epithecio concaviusculo (latit. circiter  $\cdot 2$  mm.); sporæ 2 næ rarissime 3 næ, incolores oblongo-fusiformes (sæpius uno apice obtusæ, altero acuminatæ), (11—21)—loculares,  $\cdot 07$ — $\cdot 1 \times \cdot 009$ — $\cdot 012$  mm.; paraphyses distinctæ, apice inspersæ; hypothecium incolor vel leviter lutescens. Iodo gel. hym. non tincta vel obsolete cærulescens, sporæ cæruleo-infuscatæ.

Corticola, Brisbane (coll. Bailey, 201).

OPEGRAPHIA INTRUSA, *sp. nov.*

Parasitica supra thallum et apothecia *Verrucariæ circumrubentis*; apothecia nigra prominula parva oblonga (longit.  $\cdot 4$ — $\cdot 8$  mm.), epithecio-rimiformi hinc inde expansulo; sporæ 4 næ rarius 2 næ fuscae, 1—septatæ, medio constrictæ, oblongæ,  $\cdot 016$ — $\cdot 018 \times \cdot 007$ — $\cdot 009$  mm.; paraphyses parcæ graciles irregulares, apicibus nigris vel cæruleo-nigris (K

cæruleis); hypothecium incolor. Iodo gel. hym. leviter vinose rubescens vel fere incolor. Brisbane (coll. Bailey, 125 ex parte).

*ENDOCARPON BAILEYI*, *sp. nov.*

Thallus pallidus vel glaucescenti-pallidus, firmus crassiusculus (crassit. usque ad .5 mm.), late expansus (latit. 1—2—pollicaris), corniculato-convolutus et bullatus, fere cerebriformis, ambitu nonnihil lobato-divisus, chrysogonicus, subtus pallide fuscescens; perithecia innata pallida sed supra annulo nigro munita; sporæ 8 næ fere uniseriatæ fuscae vel fusco-nigræ, variabiles, ellipsoideæ, oblongæ et interdum fere sphaericæ, irregulariter loculosæ, fere mura-lidivisæ, .014—.023 x .0085—.014 mm.; paraphyses graciles longæ, in gelatina firma involutæ; hypothecium incolor. Iodo gel. hym. non tincta.

Corticola, Brisbane (coll. Bailey, 249).

This lichen presents several peculiarities, but meanwhile it is preferable to rank it under the genus *Endocarpon*.

*VERRUCARIA OBOVATA*, *sp. nov.*

Thallus macula albida vel pallida indicatus; apothecia nigra prominula hemisphaerica (latit. .3—.4 mm.), perithecio demidiatim nigro crassiusculo; sporsæ (6—8) næ in thecis saccatis incolores dein fuscae vel fusco-nigri-cantes, oviformes (i.e., uno apice acutiores), 1—septatæ (septo apici acutiori viciniore), .022—.032 x .009—.012 mm.; paraphyses graciles confertæ, molliusculæ. Iodo gel. hym. non tincta.

Ad cortices (præsertim juniores) prope Brisbane (coll. Bailey, 125). Arcte affinis *V. conothelence* (Nyl.) sed differt colore thalli, magnitudine sporarum, &c.

*VERRUCARIA FLAVENTIOR*, *sp. nov.*

Thallus bene flavens (K aurantiaco-rubens), nitidus crassus, nodulosus vel noduloso-rugosus, diffractus; apothecia nigra, plerumque tota immersa, solum ostiolis pallidis denudatis, demum partim emersa, perithecio integre nigro; sporæ 8 næ fuscae, oblongæ vel ellipsoideo-oblongæ, 4—loculares, .018—.025 x .008—.011 mm.; paraphyses inspersæ. Spermogonia nigra parva (partim immersa); spermatia recta, cylindraceo-aciculares, .015—.023 x circ. .0006 mm.

Corticola prope Brisbane (No. 244).

The spores are, for the most part, old and shrivelled, and the dimensions given above may not indicate the fully developed size.

*VERRUCARIA CIRCUMRUBENS* (Nyl.) *RUBROTECTA* (Strn.).

Thallus macula pallida vel pallide lutescente, nitida indi-

catus; apothecia nigra prominula (basi latit.  $\cdot 6$ — $\cdot 9$  mm.), fere omnino erythrinose oblecta, perithecio integre nigro sed supra crasso, infra tenuiore; sporæ (4—8) næ, incolores demum olivaceæ, ellipsoideæ, 4—loculares (loculis sæpissime sexangularibus, rarissime semel divisis); paraphyses graciles, granulis et guttulis oleosis inspersæ. Iodo gel. hym. non tincta.

Corticola, Brisbane (coll. Bailey, 124).

The red colour is rendered intense—purpureo-violaceous by K.

STRIGULA ELATIOR, *sp. nov.*

Thallus adnatus, pallidus vel pallide virescens, nitidus, maculiformis, rotundatus, effiguratus vel ambitu nonnihil lobulatus, statu juvenili pilis longiusculis pallidis adpersus; apothecia nigra minuta innata, perithecio dimidiatim nigro; sporæ 8 næ in thecis oblongis inæqualiter fusiformes (*i.e.* una parte latiores obtusiores altera tenuiores acutiores), 1—septatæ,  $\cdot 018$ — $\cdot 023 \times \cdot 005$ — $\cdot 0065$  mm.; paraphyses parvæ distinctæ breviusculæ filiformes granuloso-inspersæ. Iodo gel. hym. non tincta, protoplasma thecarum vinose fulvescens vel fulvescens.

Ad folia viva prope Herbert River (coll. Bailey, No. 96).

PLAGIOTHELIUM AUSTRALIENSE, *gen. nov.*

Thallus pallescens vel pallide lutescens, rugulosus vel nodulosus; apothecia nigra tota immersa, in prominentiis thallinis sita, solum ostiolis nigris umbilicatis emersis, perithecio integro crasso et supra oblique et longe ampullaceo, interdum 2—3 peritheciis appositis; sporæ 2 næ incolores dein fuscae vel fusco-nigræ, muralidivisæ,  $\cdot 14$ — $\cdot 2 \times \cdot 035$ — $\cdot 045$  mm.; paraphyses longæ confertæ graciles distinctæ sed molliusculæ. Iodo gel. hym. dilute vinose rubescens.

Corticola (coll. Bailey, No. 58).

In every instance the peridium is obliquely set, and has a longish oblique neck, ending in a minute ostiolum, but here and there 2, or even 3, of these peridia are clustered and apparently enclosed in the same black stroma. Accordingly, this curious lichen has affinities to *Trypethelum*, but may well constitute the type of a new genus under the name given above.

*Lichens contributed by MR. HUGH PATON, of Glasgow.*

LEPTOGIUM PATONI, *sp. nov.*

Thallus expansus, olivaceus vel obscure olivaceus, membranaceus, læviusculus vel hinc inde tenuissime rugulosus,

lobatus, lobis rotundatis et dentato-crenatis, subtus nudus et pallidior; apothecia carnea vel interdum dilute carneol rufa, plerumque elevata, mediocria, margine thallino lævigato tenui cincta; sporæ 8 næ incolores, fusiformes, apice acuminatæ, 5—septatæ, interdum (4—6) næ,  $\cdot 038$ — $\cdot 045$  x  $\cdot 005$ — $\cdot 007$  mm.; paraphyses distinctæ filiformes. Iodo gel. hym. intensive cærulescens.

Spermatia recta apicibus incrassatula,  $\cdot 004$ — $\cdot 005$  x  $\cdot 001$  mm. Gonimia moniliformi-disposita oblonga,  $\cdot 009$  x  $\cdot 005$  mm.

Corticola, Ohœwai, Bay of Islands, N.Z.

STICTA PERISSA, *sp. nov.*

Thallus pallidus, lurido-pallidus vel pallide rufescens firmus, lævigatus, late expansus, fere totus lineari-laciniatus, laciniis subpinnatifidis, apice plerumque retusis, subtus nigricans vel niger, ambitum versus cervinus, tomento concolore denso brevi indutus; cyphellæ sat magnæ, fundo pulverulentæ albæ; apothecia marginalia (latit. 2—3 mm.), fusca, receptaculo granulato-ruguloso, juniore sordide ve, albide ciliato, margine crenulato; sporæ 8 næ fuscae 1—septatæ, rarius 3—septatæ,  $\cdot 024$ — $\cdot 036$  x  $\cdot 008$ — $\cdot 011$  mm.

Ohœwai, N.Z.

This lichen plays between *St. laciniata* and *St. dissimulata*, but the cyphellæ are truly thelotremoid—i.e., with distinct cups, having sharp elevated margins, while they are covered with white powder. The small undeveloped cyphellæ appear almost as pseudo-cyphellæ.

PSOROMA DISPERSUM, *sp. nov.*

Thallus pallidus vel pallide cervinus, squamulosus, squamulis dispersis, contiguus et interdum imbricatus, margine crenatis et hypothallo nigro insitis; apothecia fusca vel fusco-nigra, plana, margine thallino crenato inflexo cincta; sporæ 8 næ, incolores, simplicis ellipsoideæ vel sæpius fusiformi-ellipsoideæ,  $\cdot 018$ — $\cdot 025$  x  $\cdot 009$ — $\cdot 011$  mm.; hypothecium rufum. Iodo gel. hym. leviter cærulescens dein vinose rubens.

Corticola, Gippsland, Australia.

LECANORA MUNDULA, *sp. nov.*

Thallus albidus vix ullus visibilis; apothecia rosea vel interdum cocinea biatorina, plana vel convexiuscula obtuse vel vix marginata (latit.  $\cdot 6$  mm.); sporæ 8 næ incolores, fusiformi-ellipsoideæ, simplices,  $\cdot 008$ — $\cdot 01$  x  $\cdot 003$ — $\cdot 004$  mm.; paraphyses graciles conglutinatæ apicibus late rufis conglutinis, K purpureo-violaceis; hypothecium incolor. Iodo gel. hym. cærulescens.

Corticola, Gippsland, Australia.

LECIDEA SUBHYALINA, *sp. nov.*

Thallus albus tenuis nonnihil squamulosulus; apothecia electrina pellucida primum planiuscula et vix marginata dein convexa et fere globosa; sporæ (2—8?) næ, incolores, simplicis, ellipsoideæ,  $\cdot 015$ — $\cdot 02$  x  $\cdot 0065$ — $\cdot 009$  mm.; paraphyses nullæ (proprie siccitæ), epithecium incolor; hypothecium incolor. Iodo gel. hym. leviter cærulescens dein fulvescens.

Corticola, Gippsland in Australia.

The entire hymenium is gelatinous. The apothecia appear under a Codington lens as little particles of clear amber without any apparent structure. I have not been able to detect more than two spores in each theca, although a presumption is afforded on other grounds that the normal number is 8. There were very few thecæ or spores seen.

LECIDEA GROSSULINA, *sp. nov.*

Thallus albidus vel pallidus tenuissimus fere continuus; apothecia sessilia nigra mediocria (latit. circiter 1 mm.), plana et obtuse marginata dein convexa et immarginata; sporæ 8 næ in thecis oblongo-saccates, incolores, ellipsoideæ, 1—septatæ,  $\cdot 022$ — $\cdot 034$  x  $\cdot 013$ — $\cdot 018$  mm.; paraphyses graciles distinctæ confertæ apicibus conglutinatis cærulee nigris interdum fusco-nigris; hypothecium incolor vel fere incolor. Iodo gel. hym. cærulescens dein vinose rubens.

Corticola, Fern-tree Gully in Australia.

GRAPHIS GYRIDIA, *sp. nov.*

Thallus albidus tenuis hinc inde visibilis; apothecia tota pallida vel pallide lutescentia, segregata, prominula, pulverulenta (latit.  $\cdot 2$ — $\cdot 3$  mm.), ramosa et plerumque stellatim divisa, epithecio rimiformi; sporæ 8 næ incolores obtuse fusiformes, (6—9)—loculares oculis mediis interdum semel divis,  $\cdot 018$ — $\cdot 025$  x  $\cdot 006$ — $\cdot 0075$  mm.; paraphyses distinctæ, crassiusculæ; hypothecium incolor vel pallide lutescens. Iodo gel. hym. leviter vel obsolete cærulescens.

Corticola, Gippsland.

In one of Mr. Paton's parcels there were detected traces of a *Parmelia*, presenting characters so closely resembling those of one sent by Mrs. Roy, of Royston Park, Owen Sound, Ontario, Canada, that I am inclined to identify them.

The following is a description of the Canadian lichen:—

PARMELIA ROYI, *sp. nov.*

Thallus cinereo—vel cervino-fuscescens, cinereo-rufescens vel interdum obscure olivaceus (K nonnihil flavescens), substellatus, laciniatus, laciniis interdum imbricatis (et tunc latioribus, planis), incis, et lineari-multifidis, convexiusculis,

hinc inde transversim diffractis (latit. 1—3 mm.), subtus dense fuligineo-pannosa vel spongiosis; medulla albida K—C—; apothecia rufo-fusca vel fusco-nigra, plana (latit. 1—4 mm.), receptaculo extus furfuraceo sed non rugoso et margine tenui nonnihil inflexo; sporæ numerosæ (100 et ultra), incolores, simplices, lineares sed arcuatæ vel crescenticæ,  $\cdot 009$ — $\cdot 013$  x  $\cdot 0025$ — $\cdot 003$  mm. Iodo gel. hym. vix tincta, thecæ cærulescentes.

Corticola, Owen Sound in Canada (Mrs. Roy).

Affinis *P. tæniatæ* (Nyl.) sed distincta.

The receptacle of the apothecia is externally yellowish, and finely tomentoso-furfuraceous, as in that of several *Peltigerae*.

# ART. XI.—*Suggestions for a New and Economical Method for the Scientific Production of some Acids.*

BY EDWARD LLOYD MARKS, LECTURER ON CHEMISTRY, &C.,  
SCHOOL OF MINES, SANDHURST.

[Contributed October 14th, 1880.]

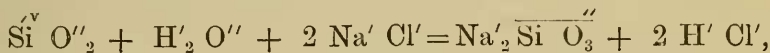
REFLECTING upon the important rôles played by Silica in the formation of numerous natural and artificial bodies, also upon its application in the manufacture of technical products of great utility in scientific and industrial pursuits, it has occurred to me that advantage might be taken of its chemistry in a way that might be useful in the production of some acids, and possibly on a large scale, where circumstances are favourable.

It will be remembered that, at varying temperatures, opposite effects may be produced with the same materials—affinities stable at a low may be reversed by a high heat, and conversely: numerous facts might be cited to verify the statement. The stability of the alkaline Silicates is readily overcome by a moderate heat, whilst in consequence of the non-volatility of Silica, even at the highest temperatures, salts of volatile acids are readily decomposed by *it*, their acidulous radicals being liberated; consequently, open for collection.

Silicates may have several formulæ. Those to which I am about to refer are the meta-silicates, whose types are

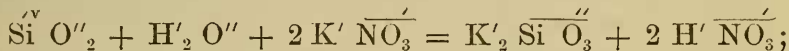
$\overset{M'}{M}_2 \overline{\text{Si} \overset{O''}{\text{O}}_3}$  and  $\overset{M''}{M} \overline{\text{Si} \overset{O''}{\text{O}}_3}$ ;  $M'$  and  $M''$  respectively, indicating univalent and bivalent basylous radicals, one atom of the latter, or two of the former, being saturated by the diabasic silicic radical.

To illustrate the process for the production of acids, I will take, firstly, the reactions going on during the glazing of pottery with salt. It is well known that although salt may be volatilized unchanged, a white heat failing to dissociate its elements, yet, in the presence of moisture and Silica, it is readily decomposed, thus:—

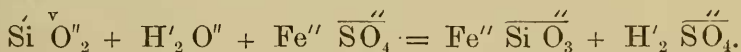


metasilicate of sodium and hydrochloric acid being the results, the latter through its volatility escaping, and hence condensable.

If then, as suggested by that formula, we substitute, say, nitrate of sodium or of potassium, we shall equally obtain nitric acid, thus:—



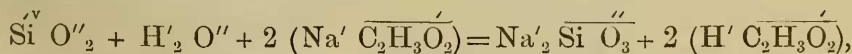
or using ferrous sulphate—at times a waste product, always a cheap article—we get sulphuric acid.



In addition to the primary object, there remains as a by-product, a meta-silicate available for use in soap-making, paint manufacture, or for rendering matters incombustible, &c., &c.

It may be said that in the cases of the nitric and sulphuric acids the formation of anhydrides would result, but as these bodies, in the presence of moisture, would re-form acids, I think that point is answered.

Suppose again that acetic acid be required, framing an equation upon the same formula we get



and so on, varying the quantities of the substance to be decomposed according as the acidulous radical is univalent, bivalent, &c.; or mono- or poly-basic in saturating power.